

UTAH FLORA: MISCELLANEOUS FAMILIES

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ABSTRACT.— Considered in this treatment are the families Aquifoliaceae, Canabinaceae, Ericaceae, Krameriaceae, Magnoliaceae, Moraceae, Oleaceae, Pyrolaceae, Resedaceae, Tamaricaceae, and Tiliaceae. These 11 families include 61 cultivated, escaped, and indigenous species.

The flora of Utah is both large and diverse. A portion of the diversity is due to the presence of a large number of cultivated species in many plant families. Floras of regions have traditionally avoided inclusion of strictly cultivated species. Only those taxa which escape and become acclimated have been treated. Included are the cultivated plants and those species which escape. The present treatment covers all taxa in common cultivation, and especially those which are represented in regional herbaria. In Table 1 a list is presented of the families treated herein, the numbers of genera and species, and whether cultivated or indigenous.

The list heavily favors the cultivated and/or escaped species, and, because of the status of cultivated species collections, the treatment is likely to be incomplete. It is presented herein for use by students of the flora who want to know the names of cultivated and of native plant species.

1. Flowers in axillary clusters on branches of the previous year *I. aquifolium*
— Flowers in solitary cymes on branches of the current year *I. opaca*

Ilex aquifolium L. English Holly. Tall shrubs to small trees of ornamental plantings, rare in Utah; introduced from the Old World; 1(0).

Ilex opaca Art. American Holly. Low to moderate shrubs of ornamental plantings, occasional in Utah; introduced from the eastern United States; 1(0).

AQUIFOLIACEAE

Holly Family

Evergreen Shrubs or small trees: leaves alternate, simple, coriaceous, armed with spiny teeth; stipules minute, caducous; flowers usually imperfect, regular, small and inconspicuous, solitary or few in axillary cymes; sepals usually 4, more or less connate basally; petals usually 4, distinct or slightly connate basally; stamens or staminodes usually 4 (-9), alternate with the petals; pistil 1, the ovary superior, 3- to many-loculed, the carpels as many as the locules; fruit a globose, berrylike drupe with 2-8 bony 1-seeded divisions.

ILEX L.

Evergreen; leaves thick and shining; flowers small, mostly in few-flowered axillary cymes; staminodia usually present in pistillate flowers, a rudimentary pistil present in most staminate flowers; fruit usually brightly colored. (Note: Members of this family are known in Utah in cultivation only).

CANNABINACEAE

Hemp Family

Plants herbaceous, with watery juice; leaves alternate or opposite, palmately veined and lobed or divided to essentially compound; stipules persistent; flowers imper-

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fect, the plants dioecious, regular, the staminate in open racemes or panicles, the pistillate in dense clusters; sepals 5, connate in

pistillate flowers and enclosing the ovary; stamens 5; pistil 1, 2-carpelled, the styles 2; fruit an achene.

- 1. Plants strong-smelling, stout, erect herbs; leaves palmately 5- to 9-parted .. *Cannabis*
- Plants rough-stemmed clambering vines; leaves coarsely 3- to 7-lobed *Humulus*

CANNABIS L.

Plants dioecious or rarely some monoecous; leaves palmately lobed to parted and apparently compound, alternate or the lower opposite; flowers small, inconspicuous, the staminate in leafy panicles in upper axils; sepals 5, oblong; stamens 5; pistillate flowers in small clusters on leafy branches from upper axils, each flower subtended and enclosed by an acuminate bract, the calyx barely lobed, surrounding only the base of the ovary; stigmas 2, elongate; fruit a lenticular achene, enclosed within the accrescent bract.

Small, E. and A. Cronquist. 1976. A practical and natural taxonomy for *Cannabis*. Taxon 5: 405-435.

Cannabis sativa L. Hemp, Marijuana, Hashish, Pot, Grass. Plants 6-20 dm tall or more, the stems simple or much branched; leaves long petioled, the blades 3- to 7-parted, the segments oblanceolate to elliptic, attenuate to acuminate apically, sharply serrate, mostly 4-12 cm long and 0.4-1.8 cm wide, scabrous and more or less glandular and pubescent; achenes mostly 3.5-4.5 mm long. Cultivated historically in Utah for fiber

produced from the stems, the commercial source of hemp; currently sporadic, or else grown illegally for its intoxicant properties. Utah materials are sufficiently rare as to give only hints as to the classification below the species level. It seems likely, however, that, at least historically, two phases have been grown in the state (for a complete review see Small and Cronquist l. c.). Nineteenth-century plantings for hemp likely belonged to sp. *sativa*, demonstrated to have only limited intoxicant ability. At least some of the recent introductions clearly belong to sp. *indica* (Lam.) Small & Cronq. (*C. indica* Lam.), which has demonstrated high intoxicant levels.

HUMULUS L.

Plants herbaceous, twining, perennial vines; stems scabrous; leaves opposite, broadly 3- to 5-lobed; flowers small, inconspicuous, the staminate in axillary panicles; sepals 5, distinct; stamens 5; pistillate flowers in short spikes, in pairs, with each pair subtended by a foliaceous bract; calyx membranous, unlobed, closely covering the ovary; stigmas 2, elongate; fruit an achene enclosed by the persistent calyx and accrescent bracts.

Humulus americanus Nutt. American Hop. Plants twining, the stems to 20 dm long or longer; leaves ovate to orbicular in outline, deeply cordate basally, mostly 3-15 cm long and 2.8-16 cm wide, the lobes serrate to doubly so, attenuate to acuminate apically, rough-hairy above, glandular-dotted beneath; fruiting spikes usually 2-3.5 (4) cm long at maturity. Twining over shrubs and other vegetation at lower and middle elevations in Duchesne, Garfield, Grand, Millard, Piute, Salt Lake, Summit, Uintah, Utah, Wasatch, Washington, and Weber counties, and probably throughout Utah; widespread in North America. The hop of commerce, *H. lupulus*

TABLE 1. Families, genera, and species treated.

Family	No. Genera	No. Species	
		Cultivated	Indigenous
Aquifoliaceae	1	2	
Canabinaceae	2	1	1
Ericaceae	6	0	11
Krameriaceae	1	0	2
Magnoliaceae	2	4	
Moraceae	3	4	
Oleaceae	6	14	4
Pyrolaceae	3	0	7
Resedaceae	1	1	
Tamaricaceae	1	3	
Tiliaceae	1	7	
TOTAL	27	36	25

L., or European hop, is grown in the United States, where it has escaped and persists. Though not definitely known for Utah, the European hop might occur here. It can be distinguished by its unlobed leaves, or when lobed, the terminal lobe is less than twice longer than broad; 27(v).

ERICACEAE
Heath Family

Shrubs or subshrubs; leaves simple, alternate, sometimes leathery or persistent; flow-

ers perfect, regular, axillary, in terminal clusters, or solitary; sepals mostly 4 or 5, distinct or more or less connate; petals mostly 4 or 5, connate or distinct, the corolla rotate to funnelform or urn shaped; stamens as many as the corolla lobes and alternate with them or twice as many, the anthers dehiscent by terminal pores or by longitudinal slits; pistils 1, the ovary superior or inferior, usually with 4-10 carpels and locules; styles 1, the stigma capitate or lobed; fruit a capsule or a berry.

- 1. Ovary inferior or apparently so 2
- Ovary superior 3
- 2(1). Plants prostrate shrublets, rooting along the stems; ovary superior but surrounded by the fleshy calyx when ripe and apparently inferior *Gaultheria (humifusa)*
- Plants erect or ascending, rooting only at the base; ovary inferior *Vaccinium*
- 3(1). Flowers borne in terminal corymbs, white, the segments of the corolla much longer than the short tube; leaves punctate below with yellow-glandular dots ... *Ledum*
- Flowers solitary and axillary or in axillary racemes, rarely terminal, pink to lavender, the segments of the corolla much shorter than the tube; leaves lacking glandular punctae 4
- 4(3). Corolla broadly saucer shaped or rotate, not constricted at the apex *Kalmia*
- Corolla campanulate to urn shaped, often more or less constricted at the throat 5
- 5(4). Corolla campanulate; anthers lacking appendages; fruit a capsule embedded in a fleshy calyx *Gaultheria (humifusa)*
- Corolla urn shaped; anthers 2-awned; fruit a berry *Arctostaphylos*

ARCTOSTAPHYLOS Adams

Evergreen prostrate to ascending or erect shrubs, often with purplish to orange brown, smooth bark; leaves alternate, simple, entire, leathery-thickened; flowers in terminal panicles or racemes, perfect, regular; sepals usually 5; petals usually 5, united almost to the tips; corolla urn shaped; stamens usually 10, included; anthers opening by falsely terminal

pores, each with 2 hornlike appendages; ovary superior, usually 5-loculed; fruit fleshy, berrylike, 1- to several-seeded.

Adams, J. E. 1940. A systematic study of the genus *Arctostaphylos*. J. Elisha Mitchell Soc. 56: 1-62.

Eastwood, A. 1934. A revision of *Arctostaphylos* with keys and descriptions. Leaf. West. Bot. 1: 105-127.

- 1. Plants with creeping-prostrate stems; leaves obovate-spatulate, commonly less than 1.5 cm long *A. uva-ursi*
- Plants with stems ascending to erect; leaves mostly ovate to lanceolate or elliptic, often more than 2 cm long 2

- 2(1). Calyx and pedicels puberulent with spreading glandular hairs; twigs and leaves puberulent throughout with spreading hairs; plants of Washington County *A. pringlei*
- Calyx glabrous or nearly so; twigs and leaves puberulent or sessile to sparingly stipitate-glandular or almost or quite glabrous; plants of various distribution 3
- 3(2). Twigs and axis of inflorescence white-puberulent, not glandular; plants of Washington and Kane counties *A. pungens*
- Twigs and axis of inflorescence glandular to glandular-puberulent; plants widely distributed *A. patula*

Arctostaphylos patula Greene. Green-leaf Manzanita. (*Uva-ursi patula* (Greene) Abrams; *A. pungens* var. *platyphylla* Gray; *A. platyphylla* (Gray) Kuntze; *A. obtusifolia* Piper; *A. patula* var. *incarnata* Jeps.; *A. pinetorum* Rollins; *A. parryana* var. *pinetorum* (Rollins) Weislander & Schreiber). Rounded shrubs with gnarled stems to 15 cm long or more, the bark smooth, cinnamon to reddish brown or purplish in color; branchlets glandular-puberulent and sometimes with long-spreading hairs as well; leaf blades (0.8) 1.8–4.7 cm long, (0.6) 1.5–4 cm wide, ovate to elliptic, lanceolate, or orbicular, obtuse to acute apically, rounded to truncate basally, glabrous or glandular, yellow green; petioles pubescent like the twigs; inflorescence paniculate, the axis and bracts glandular-puberulent and sometimes with some long hairs; pedicels glabrous; sepals glabrous; corolla pink to white, 5–8 mm long; ovary glabrous; fruit 8–11 mm thick, depressed-globose, glabrous, white to brown, with nutlets separable or not. Usually associated with ponderosa pine at 1520 to 2830 m in Beaver, Duchesne, Garfield, Iron, Juab, Kane, Millard, San Juan, Sanpete, Sevier, Summit, Tooele, Uintah, Utah, Wasatch, and Washington counties; Colorado, Nevada, Oregon, Arizona, and California. *Arctostaphylos patula* and *A. platyphylla* both date as species from the same year, 1891; the question of which has priority is difficult to ascertain; 64(x).

Arctostaphylos pringlei Parry. Pink-bracted Manzanita. Rounded, erect shrubs to 20 dm tall or more, the bark smooth, dull red brown; branchlets densely glandular-hairy with long-spreading hairs; leaf blades (1.2) 1.8–4.2 cm long, (0.4) 0.8–2 cm wide, elliptic to lance-elliptic or lanceolate, obtuse to acute apically, truncate to rounded or obtuse basally, glandular-pubescent, gray green; pe-

tiolos pubescent like the twigs; inflorescence paniculate or racemose, the axis and bracts glandular-hairy; corolla pink, 6.5–8.5 mm long; ovary glandular-hairy; ovary glandular-hairy; fruit 6–10 mm thick, ovoid, glandular-hairy, red, with nutlets inseparable. Oak-juniper community, 1840–2750 m, in Washington County; Arizona, California and Baja California; 4(o).

Arctostaphylos pungens H.B.K. Mexican Manzanita. Erect or ascending, rounded shrubs to 20 dm tall or more, the bark smooth, red brown; branchlets canescent with a dense pubescence; leaf blades 1.6–4.7 (6) cm long, 0.5–3.2 cm wide, ovate to elliptic or oblong, rounded to acute apically, acute to rounded basally, puberulent on one or both sides, bright green; petioles pubescent like the twigs; inflorescence paniculate, the axis and bracts canescent; pedicels glabrous; sepals glabrous; corolla pink to white, 5.5–8.5 mm long; ovary glabrous; fruit 5–8 mm thick, depressed-globose, glabrous, brownish red, with nutlets separable or not. Pinyon, juniper, live oak communities, 920–2750 m, in Washington and Kane (Atwood 3538 BRY) counties; California, Arizona, New Mexico, Texas; Mexico; 19(iii).

Arctostaphylos uva-ursi (L.) Spreng. Kin-kinnick, Bearberry, Sandberry. (*Arbutus uva-ursi* L.; *Uva-ursi procumbens* Moench; *Mairania uva-ursi* (L.) Desv.; *U. buxifolia* S. F. Gray; *A. officinalis* Wimm. & Grab.; *A. procumbens* in Mey. & Elkan; *U. uva-ursi* (L.) Britt. in Britt. & Br.; *A. media* Greene; *A. uva-ursi* var. *coactilis* Fern. & Macbr.; *A. uva-ursi* var. *adenotricha* Fern. & Macbr.). Prostrate shrub with stoloniferous rooting stems, mat-forming, the branches ascending, the internodes usually apparent, puberulent and sometimes glandular, the bark exfoliating exposing dull brown under bark; leaf blades

(0.6) 1-2.7 (3) cm long, 0.3-1.2 wide, oblanceolate to spatulate, rounded apically, cuneate to acute basally, glabrous or puberulent, especially on the margins, green; inflorescence racemose, the axis and bracts glandular; pedicels glabrous or sparingly puberulent; sepals glabrous; corolla pink to white, 4-5.2 mm long; ovary glabrous; fruit 6-11 mm thick, globose, bright red, with separable nutlets. Ground layer in coniferous forests, at 2140-3350 m, in Daggett, Duchesne, Garfield, Salt Lake, Sevier, Summit, Uintah, and Wasatch counties; Alaska and Yukon east to the Atlantic and south to California, New Mexico, Illinois, and Georgia; Eurasia: 15(ii).

GAULTHERIA L.

Prostrate shrubs, the branches rooting; leaves alternate, thin, serrulate; flowers axillary, solitary, perfect, regular; calyx 5-lobed, united, enlarging and becoming fleshy at maturity; corolla campanulate, the lobes shorter than the tube; stamens usually 10, included, the filaments flattened, tapering to the apex; anthers opening by terminal pores, not awned; ovary superior, usually 5-loculed; fruit a loculicidally dehiscent capsule enclosed by the fleshy expanded calyx.

Gaultheria humifusa (Grah.) Rydb. Alpine Wintergreen. (*Vaccinium humifusum* Grah.; *G. myrsinites* Hook.). Prostrate, scarcely woody plants with creeping, rooting stems to 2 dm long, glabrous or puberulent; leaves 0.6-1.5 cm long, 0.4-1.3 cm wide, oval to ovate or elliptic, rounded to obtuse apically and basally, serrulate; flowers solitary, axillary; calyx glabrous; corolla 3-4 mm long, campanulate, pink; fruit 5-7 mm thick, subglobose, red. Ground layer in coniferous forests and margins, 2900-3350 m, in Duchesne and Summit counties, and possibly elsewhere; Colorado westward to California and north to Alberta and British Columbia; 5(i).

KALMIA L.

Low shrubs with puberulent branches; leaves opposite, evergreen, leathery, decurrent, entire, revolute, glaucous beneath; flowers in terminal leafy-bracted corymbs or soli-

tary, perfect, regular; calyx 5-lobed, the segments almost distinct; corolla bowl shaped, the lobes shorter than the tube, the tube with 10 pouches in which the anthers are enclosed in bud; stamens usually 10, the filaments flattened, hairy below; anthers opening throughout, unawned; ovary superior, 5-loculed; fruit a septicidally dehiscent capsule.

Kalmia microphylla (Hook.) Heller. Bog Laurel. (*K. glauca* var. *microphylla* Hook.; *K. polifolia* var. *microphylla* (Hook.) Rhed.). Erect slender shrubs, 0.7-1.5 dm tall; leaves 0.6-1.8 (3) cm long, 0.2-0.8 (1.2) cm wide, lance-oblong to elliptic, revolute, shining and green above, grayish beneath; corymbs mostly 2- to 6-flowered, the pedicels 1-3 cm long; sepals glabrous, ciliate; corollas 11-14 mm broad, pink; capsules 4-6 mm broad. Alpine meadows and lake margins, 2900-3800 m, in Daggett (?), Duchesne, Summit, and Uintah counties; Alaska and Yukon south to California and Colorado; 11(i).

LEDUM L.

Erect or spreading shrubs with glandular-puberulent branchlets; leaves alternate, evergreen, leathery, entire, revolute, pale below; flowers in terminal corymbs, perfect, regular; calyx small, the segments almost distinct; corolla rotate, the 5 petals distinct or nearly so; stamens usually 5-10, the filaments almost filiform, usually hairy below; anthers opening by terminal pores, unawned; ovary superior, 5-loculed; fruit a septicidally 5-valved capsule, opening at the base. Note: At least some species of this genus are poisonous to livestock.

Ledum glandulosum Nutt. Trapper's Tea. Plants mostly 5-15 dm tall, the branchlets puberulent and glandular dotted; leaves 1.1-3.4 (4) cm long, 0.4-1.4 (1.8) cm wide, elliptic to oblong, rounded to acute apically and basally, green above, pale to grayish beneath, glandular, the margin more or less revolute; flowers white, the segments to 5 mm long or more; pedicels commonly 1-2.5 cm long, puberulent near the base; capsules 3-6 mm long, puberulent and glandular. Meadows, stream banks, and bogs in open forest, 2600-3050 m, in Duchesne, Salt Lake,

Summit, and Uintah counties; British Columbia east to Montana and south to California, Nevada, and Wyoming; 9(o).

VACCINIUM L.

Decumbent-ascending to erect shrubs; leaves alternate, deciduous, or more or less evergreen, entire or serrulate, flat, green or pale beneath; flowers solitary, axillary, or in terminal clusters, perfect, regular; calyx 4-

6-lobed, united at the base; corolla urn shaped or campanulate, the 4-6 lobes shorter than the tube; stamens 8-12, the filaments usually glabrous; anthers opening by pores at the ends of tubular beaks, usually 2-awned; ovary inferior, usually 4-locular; fruit a several-seeded berry.

Camp, W. H. 1942. A survey of the American species of *Vaccinium*, subgenus *Euvaccinium*. *Brittonia* 4: 205-247.

- 1. Branches bright green and angled; plants often less than 3 dm tall 2
- Branches neither bright green nor angled, or sometimes irregularly angled when dry; plants often more than 3 dm tall 3
- 2(1). Fruit red; grooves of branches usually glabrous; leaves often less than 12 mm long *V. scoparium*
- Fruit blue black or black; grooves of branches usually puberulent; leaves often over 12 mm long *V. myrtillus*
- 3(1). Flowers in clusters of 2-4, or solitary; leaves entire; calyx deeply lobed, the lobes persistent in fruit *V. occidentale*
- Flowers solitary in leaf axils; leaves more or less serrate; calyx shallowly lobed, the lobes deciduous in fruit 4
- 4(3). Plants mostly 1-3 dm tall; leaves serrate above the middle and un conspicuously below the middle, mainly 1-3 (4) cm long, oblanceolate to obovate .
..... *V. caespitosum*
- Plants mostly 4-7 dm tall or more; leaves serrate to the base or nearly so, commonly 2-6 cm long, elliptic to ovate *V. membranaceum*

Vaccinium caespitosum Michx. Dwarf Huckleberry. Plants mostly 1-3 dm tall; twigs brownish, somewhat angled, puberulent or glabrous; leaves 0.7-4 cm long, 0.3-2 cm wide, oblanceolate to obovate, obtuse or less commonly acute to rounded apically, usually cuneate basally, serrulate from tip to below the middle; flowers solitary, axillary, whitish to pink, the corollas 5-6 mm long, twice as long as thick; calyx obscurely lobed, the lobes deciduous in fruit; berries blue glaucous, subglobose, 5-8 mm broad, edible and good. Streamsides, meadows, and rock outcrops, 2,227-3,416 m elevation, in the Uinta Mountains and Boulder Mountains, in Daggett, Duchesne, Garfield, Summit, and Uintah counties; Alaska and Yukon east to Newfoundland and New Hampshire, and south to California and Colorado. Materials from Utah have previously passed under the names *V. membranaceum* Dougl. (see below)

and *V. globulare* Rydb. The latter is not known for the state; 10(i).

Vaccinium membranaceum Dougl. Mountain Huckleberry. Shrubs mostly 3-7 dm tall or more; twigs brownish, glabrous or puberulent; leaves 1.8-7 cm long, 1-3.4 cm wide, elliptic or less commonly ovate or obovate, acute to obtuse apically, acute to rounded basally, serrate almost throughout; flowers solitary, axillary, yellowish pink, the corollas about 6 mm long, about one-third longer than broad; calyx obscurely lobed, the lobes deciduous; berries purple, not glaucous, 7-9 mm broad, edible and good. Slopes in aspen-conifer and spruce-fir woods, 2,500 to 2,775 m, in Cache, Carbon, Duchesne, Salt Lake (?), and Summit counties; British Columbia southward to California, Idaho, and Montana; 6(0).

Vaccinium myrtillus L. Dwarf Billberry. (*V. oreophilum* Rydb., in part, the type from

the Uinta Mountains. Plants mostly 0.5-3 dm tall; twigs seldom numerous and broomlike, green, sharply angled, puberulent; leaves 1.1-3.9 cm long, 0.6-1.6 cm wide, ovate to lanceolate or elliptic, acute to obtuse apically, obtuse to rounded basally, serrulate almost or quite from base to apex; flowers solitary, axillary, pink, the corollas 4-5 mm long; calyx shallowly lobed; berry usually bluish, 5-8 mm broad. Ground layer in coniferous forests, 2750-3200 m, in the Uinta, Wasatch, and LaSal mountains (Daggett, Duchesne, San Juan, Summit, and Uintah counties), where evidently not common; British Columbia and Alberta south to Arizona and New Mexico; Eurasia. *Vaccinium myrtillus* is a near congener of the very common *V. scoparium* and can be distinguished by the larger size of its leaves and flowers and by the puberulent stems; 6(i).

Vaccinium occidentale Gray. Western Huckleberry. Plants mostly 2-6 dm tall, the twigs round, usually glabrous; leaves 0.6-2.1 cm long, 0.4-1.2 cm wide, oblanceolate, rounded to obtuse apically, acute basally, entire; flowers 2-4, or less commonly solitary in the axils, pinkish, the corollas 3.5-6 mm long; calyx definitely lobed, the lobes persistent in fruit; berries blue, glaucous, 4-6 mm thick. Meadows, streamsides, and forest margins, 2750-3100 m, in the Uinta Mountains in Daggett (?), Duchesne, Summit, Uintah, and Wasatch counties; British Columbia south to California and Idaho; 12(iv).

Vaccinium scoparium Leiburg. Grouseberry. (*V. myrtillus* var. *microphyllum* Hook.; *V. microphyllum* (Hook.) Rydb., not Rein.; *V. erythrococcum* Rydb.). Plants mostly 1-2.5 dm tall, the twigs numerous, broomlike,

sharply angled, usually glabrous; leaves 0.6-1.3 cm long, 0.3-0.7 mm wide, ovate, obtuse to acute apically, rounded to obtuse basally, serrulate throughout; flowers solitary, axillary, pinkish, the corollas 2.5-3.5 mm long; calyx very shallowly lobed; berry bright red, drying red purple, 4-6 mm thick. Common component of ground layer in coniferous forests and forest margins, 2450-3200 m, in the Uinta Mountains in Daggett, Duchesne, Summit, Uintah, and Wasatch counties; British Columbia and Alberta south to California and Colorado; 20(i).

KRAMERIACEAE Ratany Family

Shrubs, with divaricate branches; herbage grayish pubescent; leaves alternate, simple, entire extipulate; flowers perfect, irregular, solitary, axillary; pedicels usually with 2 opposite foliaceous bracts; sepals 4 or 5, unequal; petals 5, the upper 3 long clawed, distinct or partially connate and often purplish in color, the 2 others broad, thick, sessile, usually greenish and glandlike; stamens 4, free or adnate to claw of upper petal, the anthers dehiscent by pores; ovary superior, 1-loculed; ovules 2; fruit an indehiscent pod, armed with prickles.

A family of the Western Hemisphere of a single genus with about 25 species from South America to southern United States.

KRAMERIA L.

A single genus with characteristics of the family.

1. Branchlets modified as thickened thorns 0.8-1.2 mm in diameter at base; spines of fruit barbed at apex only *K. grayi*
- Branchlets not modified as thorns or if so then less than 0.6 mm in diameter; spines of fruit with barbs scattered or, rarely, barbless *K. parviflora*

Krameria grayi Rose & Painter. White Ratany. Shrubs branched, 2.5-6 dm tall and as wide; leaves 5-7 (25) mm long, 1-3 mm wide, lance-ovate to lanceolate, elliptic or oblong, more or less spinulose-tipped, tomentose on both surfaces; pedicels not glandular-

pubescent; upper petals 2.5-3.5 mm long, 0.3-0.5 mm wide, yellowish with a purplish tip; sepals 4.5-6.5 mm long, villous-pilose dorsally, pilose to glabrate within, purplish; prickles of the fruit 2-6 mm long at maturity, each with a whorl of barbs at the apex; pods

subglobose, 6-10 mm in diameter, hirsute over the surface and on bases of prickles. Blackbrush and creosote bush communities at 670-1170 m in western Washington Co.; California, Nevada, Arizona, New Mexico, Texas, and Mexico; 2(i).

Krameria parvifolia Benth. Range Ratany. (*K. glandulosa* Rose and Painter; *K. parvifolia* var. *glandulosa* (Rose and Painter) Macbr.; *K. imparata* (Britton) Macbr.) Shrubs, intricately branched, 2-6 dm tall and as wide; leaves 3-15 mm long, 0.3-1 mm wide, linear to oblong, callous- to spinulose-tipped, tomentose on both surfaces; pedicels glandular or not; upper petals 2.5-2.8 mm long, 0.7-1.2 mm wide, yellowish; sepals 4-6 mm long, strigulose dorsally, glabrous within, pinkish to purplish; prickles of fruit 2-5 mm long, retrorsely barbed along the rachis; pods subglobose, 5-9 mm in diameter, pilose-hirsute on the surface. Joshua tree, blackbrush, creosote bush, and bursage communities, 750-1600 m, in Washington Co.; California, Nevada, Arizona, New Mexico, Texas, and Mexico. The materials demonstrate variation

in glandular condition of pedicels, sepals, and bracts. The variation seems to be haphazard, with little or no correlation with other features or with ecology. Hence, included herein as synonyms are those names involved with recognition of glandular and nonglandular phases; 16(i).

MAGNOLIACEAE

Magnolia Family

Deciduous or evergreen trees or shrubs; leaves alternate, simple, entire or lobed, stipulate, the stipules enclosing the buds, deciduous or caducous, and leaving a circular scar; flowers regular, perfect, solitary, terminal and axillary, large and showy, the floral parts spirally arranged; sepals often 3, the petals 6 to many; stamens numerous, separate, hypogynous, the anthers 2-loculed; pistils several to many, each 1-loculed and 1-carpelled; style 1, the stigma 1; fruit a follicle or samara.

- 1. Leaves lobed, truncate or broadly retuse at the apex; flowers borne after the leaves *Liriodendron*
- Leaves entire, acute, or acuminate; flowers borne before or after the leaves *Magnolia*

LIRIODENDRON L.

cm long, yellow green, with a basal orange spot within; samaras narrow, 3-4 cm long. Occasional shade tree in more moderate low elevation portions of Utah; introduced from the eastern United States; 8(o).

MAGNOLIA L.

Trees or shrubs; leaves large, entire; flowers large, conspicuous or inconspicuous; sepals 3, colored like the petals; petals 6-12, erect or spreading; anthers introrse; pistils many, en masse becoming conelike, the individual follicles finally dehiscent.

Trees, the leaves large and 4-lobed; flowers large, inconspicuously colored; sepals 3, soon reflexed; petals 6, ascending to erect, forming a tuliplike corolla; anthers extrorse; pistils many, en masse becoming conelike, the individual samaras eventually deciduous.

Liriodendron tulipifera L. Tulip Tree; Yellow Poplar. Deciduous, cultivated trees to 40 m tall or more, the trunks to 10 dm in diameter or more; leaves long-petioled, the blades 6-15 cm long and almost as wide; flowers solitary, terminal; sepals green; petals 3.7-6

- 1. Plants shrubs or small trees, deciduous; flowers showy, cream to pink or suffused with rose or lavender, borne before the leaves appear *M. soulangeana*
- Plants moderate to large trees, deciduous or evergreen; flowers greenish and inconspicuous or, if showy, then white in color and the trees evergreen 2

- 2. Plants evergreen, the leaves dark green, leathery; flowers white *M. grandiflora*
- Plants deciduous, the leaves not both dark green and leathery; flowers greenish yellow *M. acuminata*

Magnolia acuminata L. Cucumber-tree. Deciduous trees to 30 m tall or more; leaves deciduous, short-petioled, the blades 8-25 (3) cm long and 4-15 cm wide; flowers solitary, terminal; perianth greenish yellow, 5-8 cm long. Cultivated shade tree, uncommon, hardy in the major cities of the state; introduced from the eastern United States; 2(o).

Magnolia grandiflora L. Bull Bay. Evergreen trees to 30 m tall; leaves evergreen, short-petioled, the blades mostly 8-20 cm long and 3-8 cm wide; flowers solitary, terminal; perianth white, mostly 8-12 cm long. Cultivated ornamental, uncommon, not hardy except in favorable sites in moderate to warm portions in Utah; introduced from southeastern United States; 1(o).

Magnolia soulangeana Soul. Showy Magnolia. Shrubs or small trees to about 4 m tall; leaves deciduous, short-petioled, the blades mostly 8-14 cm long and 3.5-10 cm wide; flowers solitary, terminal; perianth cream to pink or suffused with rose or lavender, 6-12 cm long or more. Cultivated ornamental, oc-

casional in more moderate climatic areas of Utah; a hybrid of *M. denadata* Descr. and *M. liliflora* Descr., both native of China; 3(o).

MORACEAE

Mulberry Family

Deciduous trees or shrubs with milky juice; leaves alternate, simple, pinnately or palmately veined, entire, serrate, or lobed, stipulate, the stipules small and distinct or each pair forming a cap over the bud and leaving a scar around the stem; flowers imperfect, minute, regular, borne in cymes or much modified inflorescences; perianth of usually 4 sepals; staminate flowers with usually 4 (2 in *Ficus*) stamens, the filaments distinct; pistillate flowers with or without a 4-lobed perianth; pistil 1, the ovary superior to inferior, 1-loculed, the styles and stigmas 2 (1 in *Maclura*); fruit a multiple (*Morus*, *Maclura*) or a syconium (*Ficus*).

- 1. Fruit a fleshy hollow receptacle with flowers borne inside (syconium); leaves palmately veined and lobed; cultivated plants of Washington County, and of greenhouses elsewhere *Ficus*
- Fruit a multiple (formed of several flowers and a common axis); leaves various 2
- 2(1). Leaves crenate-serrate, palmately veined and often palmate lobed as well; flowers, both sterile and fertile, borne in catkinlike spikes; fruit seldom more than 1 cm thick *Morus*
- Leaves entire, pinnately veined, not lobed; flowers borne in dissimilar inflorescences, the sterile in racemes, the fertile in globular heads; fruit globular, more than 5 cm thick *Maclura*

FICUS L.

Trees or large shrubs; leaves alternate, simple, palmately veined and lobed, the stipules forming a circular scar around the stem; flowers minute, numerous, borne inside a hollow receptacle which ripens to form a syconium; staminate perianth 2- to 6-parted, with 1 or 2 stamens; pistillate perianth reduced or

lacking; receptacles perfect or imperfect; fruits of individual flowers of achenes.

Ficus carica L. Common Fig. Deciduous trees to 5 m tall, rarely more, often sprawling in age; leaves prominently veined, thick, to 25 cm long or more and to 20 cm broad, 3- to 5-lobed, the lobes undulate-serrulate; fruits obovoid, mostly 2.4-4.5 cm long and 2-3 cm thick. Cultivated fruit plant in Washington

(and formerly Garfield, at Hite) County, frost sensitive elsewhere except under glass; introduced from the Mediterranean region of the Old World. This is the fig of commerce; 5(iii).

MACLURA Nutt.

Dioecious trees with hard yellow wood; leaves entire, the stipules minute, the scar not encircling the stem; staminate flowers numerous in loose, peduncled, axillary heads or umbels, the calyx 4-parted and with 4 stamens; pistillate flowers coherent in dense, globose, axillary heads, the calyx 4-lobed, the single filiform style very long; fruit a globose multiple.

Maclura pomifera (Raf.) Schneid. Osage Orange. (*Toxylon pomiferum* Raf.) Trees to 10 m tall, rarely more; stems usually armed with stout thorns 1-2 cm long; leaves petio- late, the blades 5-10 cm long and 1.8-6.5 cm

wide, ovate, entire, rounded to obtuse basally, attenuate to acuminate apically; clusters of staminate flowers 2.5-3.5 cm across; heads of pistillate flowers 2-2.5 cm across; multiple fruit mostly 8-14 cm thick. Cultivated ornamental and botanical curiosity of low elevation regions in Utah, long per- sisting; introduced from the eastern states. The wood of this tree is very strong, and has served as a source of bows for American In- dians and others; 5(i).

MORUS L.

Dioecious trees; leaves palmately veined, serrate to dentate, sometimes lobed; stipules lanceolate, the scar not encircling the stem; flowers monoecious or dioecious, those of both sexes borne in stalked, axillary, catkin- like clusters; calyx 4-parted; stamens 4; styles 2, deeply parted; fruit a multiple.

- 1. Leaves glabrous above and beneath or pubescent beneath only along main veins and/or in vein axils; our common mulberry *M. alba*
- Leaves pubescent over much of the lower surface, scabrous above; rarely cultivated *M. nigra*

Morus alba L. White Mulberry. Cultivated ornamental and shade tree to 10 m tall or more; leaves obliquely ovate and crenate-ser- rate or irregularly lobed, mostly 3.5-14 cm long and 2.5-10 cm wide, truncate to sub- cordate basally, acute to acuminate apically, glabrous above and below except along veins and in vein axils; fruit 1-2 cm long and 0.6-1 cm thick, white, pink, red purple, or nearly black. Persisting and occasionally escaping in most of Utah at lower elevations; introduced from China; widespread in North America. This plant was introduced to southern Utah to provide food for silkworms in an attempt to develop a silk industry. The fruit is edible, but is consumed mainly by birds. Reports from Utah of red mulberry, *M. rubra* L., be- long here. Red mulberry is easily recognized by the densely hairy lower and scabrous up- per leaf surfaces. So-called fruitless phases are known; 24(v).

Morus nigra L. Black Mulberry. Small trees to about 10 m; leaves cordate-ovate, crenate-serrate, seldom lobed, 5-20 cm long, 3-15 cm wide, cordate basally, obtuse to acuminate apically, scabrous above and hairy over veins and at least some intervein areas below; fruit 1-2.5 cm long and to 1 cm thick, purple to black. Sparingly cultivated orna- mental, mainly in warm regions of Washing- ton County; widely cultivated in temperate regions of the earth for its fruit; introduced from Asia; 5(o).

OLEACEAE

Olive Family

Trees or shrubs; leaves opposite (or rarely alternate), simple or pinnately compound, stipulate; flowers perfect or imperfect, borne in axillary or terminal racemose, paniculate, or thyrsoid inflorescences; calyx commonly 4-

lobed or absent; corolla usually of 4 united or distinct petals, or lacking; stamens 2, distinct; pistil 1, the ovary superior, 2-carpelled and 2-loculed; style 1, or lacking, the stigmas 1 or 2; fruit a berry (*Ligustrum*), drupe (*Forestiera*), loculicidal capsule (*Syringa*, *Forsythia*), circumscissile capsule (*Menodora*), or samara (*Fraxinus*).

- 1. Leaves pinnately compound; fruit a samara *Fraxinus*
- Leaves simple, or rarely compound; fruit various 2
- 2(1). Leaves ovate to orbicular, crenate-serrate; fruit a samara; plants indigenous *Fraxinus*
- Leaves various, but seldom ovate to orbicular and crenate-serrate; fruit a drupe, capsule, or berry; plants cultivated or indigenous 3
- 3(2). Shrubs with yellow flowers appearing before the leaves; plants cultivated *Forsythia*
- Shrubs, subshrubs, or trees with flowers variously colored, but if yellow then not as above, and appearing with or after the leaves (before in *Forestiera*) 4
- 4(3). Corolla none or rudimentary, the flowers often unisexual; fruit a drupe; shrubs of stream banks in southeastern Utah *Forestiera*
- Corolla well developed, the flowers perfect; fruit a berry or a capsule 5
- 5(4). Corolla yellow; fruit a membranous, circumscissile capsule; plants indigenous subshrubs of southern Utah *Menodora*
- Corolla commonly lavender to red, purple, white, or cream; fruit a loculicidal capsule or a berry; plants cultivated shrubs or trees 6
- 6(5). Flower clusters usually less than 6 cm long; flowers white to cream; fruit a berry *Ligustrum*
- Flower clusters usually 6–30 cm long or more; flowers lavender to red, purple, lilac, white or cream *Syringa*

FORESTIERA Poir.

Sprawling indigenous shrubs; leaves opposite, simple, serrate to entire; flowers inconspicuous, polygamo-dioecious, borne sessile or in cymes, appearing before the leaves; calyx minute, unequally 5- to 6-cleft, or lacking; corolla lacking, or rarely with 2 or 3 petals; stamens 2 or 4; ovary 2-loculed, with 2 ovules per locule; style slender; stigma 1; fruit a drupe.

Forestiera pubescens Nutt. Desert Olive. (*F. neomexicana* Gray; *Adelia neomexicana* (Gray) Kuntze; *A. parvifolia* Cov.). Shrubs to 2 m tall or more; leaves (0.8) 1.5–5.5 cm long, (0.3) 0.5–2 cm wide, oblanceolate to elliptic, entire to serrulate; staminate flowers sessile; pistillate flowers pedicellate; drupe 5–7 (8) mm long, ellipsoid, blue black. Sandy terraces along the Colorado and San Juan rivers and tributaries, 1280–1750 m in Grand

and San Juan counties; California eastward to Oklahoma and Texas, and south to Chihuahua. The fruit is eaten by fox and by coyotes, and the purple-stained, stone-laden fecal pellets are to be found far from the rivers. Long known as *F. neomexicana*, our materials form a portion of a complex whose definition includes those portions known as *F. pubescens*, and that name has priority; 8(iii).

FORSYTHIA Vahl

Cultivated shrubs; leaves opposite, simple or some compound, entire to serrate; flowers perfect, showy, borne in axillary cluster of 3–5, or solitary, appearing before the leaves; calyx 4-lobed; corolla 4-lobed, campanulate; stamens 2, inserted at corolla base; ovary 2-loculed, with several ovules per locule; fruit a loculicidal capsule, with many winged seeds (ours seldom fruiting).

Forsythia suspensa (Thunb.) Vahl. Golden-bell. (*Syringa suspensa* Thunb.). Shrub to 2 m tall or more; branchlets somewhat 4-angled; leaves 6-10 cm long, ovate to lanceolate, acute apically, cuneate to rounded basally, usually serrate; flowers to 25 mm long, golden yellow; fruit lance-ovoid, to 15 mm long, seldom developing. Cultivated ornamental, common, persisting but not spreading at lower elevations throughout Utah; widespread; introduced from China. Numerous horticultural varieties are present; 2(o).

FRAXINUS L.

Deciduous, cultivated and/or indigenous trees or shrubs; winter buds often prominent, gray to brown or black; leaves opposite, pinnately compound (simple in *F. anomala*); flowers perfect or unisexual, inconspicuous, borne in panicles; calyx 4-lobed or lacking; corolla lacking or of 2 or more, usually distinct petals; stamens commonly 2; ovary 2-loculed; styles 1; stigmas 1 or 2; fruit a samara.

- 1. Leaves normally simple, sometimes with 1 or 2 leaflets below the terminal one; indigenous shrubs or small trees of eastern and southern Utah *F. anomala*
- Leaves normally pinnately compound with 5-9 or more leaflets; trees, either indigenous or cultivated 2
- 2(1). Branchlets, petioles, and axis of panicle commonly spreading hairy, seldom glabrous; leaflets usually 5 or fewer; trees, indigenous in southwestern Utah, cultivated elsewhere *F. velutina*
- 2. Branchlets, petioles, and axis of panicle variously hairy or glabrous, but seldom spreading hairy; leaflets usually 7 or more; trees, cultivated and sometimes escaping 3
- 3(2). Flowers appearing after leaves formed; corolla present *F. ornus*
- Flowers appearing before leaves formed; corolla lacking 4
- 4(3). Fruit with calyx persisting as a campanulate cap; anthers oblong; leaflets usually 5-7 5
- Fruit with calyx early deciduous or lacking (except in *F. quadrangulata*); anthers often cordate; leaflets usually 9-11 or more 6
- 5(4). Petiolules of middle and lower mature leaflets wingless nearly their entire length; winter buds black; leaf scars horseshoe shaped; wing of fruit terminal, not or only slightly decurrent *F. americana*
- Petiolules of middle and lower mature leaflets winged nearly to the base; winter buds brown; leaf scars semicircular or shield shaped; wing of fruit decurrent to below the middle *F. pennsylvanica*
- 6(4). Branchlets 4-sided, 4-angled; bark broken into plates; flowers with a minute, deciduous calyx *F. quadrangulata*
- Branchlets terete, not or only slightly 4-angled; bark smooth or irregularly roughened; flowers with calyx lacking 7
- 7(6). Leaflets glabrous or somewhat hairy along veins beneath; commonly cultivated tree *F. excelsior*
- Leaflets definitely pubescent beneath, especially along the veins, the long reddish hairs extended onto and along the leaf rachis; uncommon to rarely cultivated tree *F. nigra*

Fraxinus americana L. White Ash. Moderate to large trees; branchlets terete, green to brown, glabrous; winter buds black; leaflets

usually 7 (5-9) 6-15 cm long, petiolulate, ovate to lanceolate, acuminate apically, cuneate to rounded basally, entire to serrate,

glaucous beneath and usually glabrous; anthers oblong, apiculate; calyx persistent; corolla lacking; samaras (20) 25-35 (50) mm long, 4-7 mm wide, the wing not decurrent along the terete base. Shade tree of lower elevations in Utah; introduced from eastern North America; 5(o)

Fraxinus anomala Torr. ex Wats. Single-leaf Ash. Shrub or small tree, commonly 2.5-4 m tall, usually with many stems; branchlets 4-angled; leaves glabrous, ovate, crenate-serrate to subentire, 1.5-6.5 cm long, 1-6 cm wide, acute to obtuse or subcordate basally, acute to rounded or emarginate apically, sometimes 2- or 3-foliolate or transitional to simple; flowers usually perfect; anthers oblong; calyx campanulate, persistent; petals lacking; samaras winged almost to the base, 12-27 mm long, 5-11 mm wide. Mixed desert shrub, mainly on rimrock or along drainages, and in pinyon-juniper woodland, 900-2150 m, in Emery, Garfield, Grand, Iron, Kane, San Juan, Uintah, Washington, and Wayne counties; Colorado, New Mexico, Arizona, and California; 80(xv).

Fraxinus excelsior L. European Ash. Moderate to large trees; branchlets terete, glabrous; winter buds black; leaflets 7-11, 5-12 cm long, sessile, ovate to oblong or lanceolate, acuminate apically, cuneate basally, serrate, green beneath, glabrous except along midrib, the hairs sometimes extending to the rachis; flowers polygamous; anthers ovoid; calyx lacking; corolla lacking; samaras 25-35 (40) mm long, 5-11 mm wide, the blade decurrent almost or quite to the base of the flattened body. Shade tree of habitations and streets at lower elevations throughout Utah; introduced from Europe; 11(0).

Fraxinus nigra Marsh. Black Ash. Moderate trees; branchlets terete, glabrous; winter buds black; leaflets 7-11, mostly 6-12 cm long, sessile, lanceolate to oblong, obtuse to rounded basally, long-acuminate apically, serrate, green and glabrous except reddish-hairy along veins, the pubescence extending along the leaf rachis; flowers dioecious; anthers oblong; calyx lacking; corolla lacking; samaras mostly 25-35 mm long and 6-10 mm broad, the blade decurrent to the base of the flattened body. Sparingly cultivated shade tree at lower elevations in at least the major

population centers; introduced from eastern North America; 4 (o).

Fraxinus ornus L. Flowering Ash. Small to moderate trees; branchlets terete; winter buds gray to brownish; leaflets usually 7 (7-11), mostly 2.5-7 cm long, petiolulate, lance-ovate to obovate (terminal one), rounded to obtuse basally, acuminate apically, crenate-serrate, glabrous except along midrib; flowers perfect; calyx present, persistent, with 4 triangular-acuminate, spreading lobes; petals present, linear; samaras 20-25 mm long, 3-6 mm wide, the blade terminal on the terete base. Rarely cultivated shade and ornamental tree of lower elevations in Utah; introduced from Europe; 2(o).

Fraxinus pennsylvanica Marsh. Red Ash. Moderate trees; branchlets terete, pubescent to glabrous, sometimes glandular; winter buds olive to brown; leaflets usually 7 (5-9), 6-15 cm long, petiolulate, lanceolate to lance-oblong, acuminate apically, acute to obtuse or rounded basally, serrate to entire, green and glabrous or hairy (especially along the veins) beneath; anthers oblong, apiculate; calyx campanulate, persistent; corolla lacking; samaras 27-40 (50) mm long, the blade decurrent to the middle of the terete body or below. Common shade tree of lower elevations throughout Utah, persisting and escaping, in Box Elder, Cache, Davis, Iron, Juab, Millard, Salt Lake, Utah, and Washington counties; introduced from eastern North America. The escaped plants have become established along streams and on lake margins at lower elevations. Much of our material has glabrous branchlets and petioles, and has been designated as *F. pennsylvanica* var. *lanceolata* (Borkh.) Sarg. (*F. lanceolata* Brokh.). This phase is known as green ash; 28 (o).

Fraxinus quadrangulata Michx. Blue Ash. Small to moderate trees; branchlets sharply 4-angled, glabrous; winter buds black; leaflets 7-11, mostly 5-12 cm long, petiolulate, lanceolate to ovate-lanceolate, acute to rounded basally, acute to acuminate apically, serrate, glabrous except along the midrib or rarely hairy over the lower surface; flowers perfect; calyx minute, caducous; corolla lacking; anthers cordate-oblong, blunt; samaras 20-40 (50) mm long, the blade decurrent to the base of the flattened body. Sparingly cultivated

shade tree, at lower elevations in Utah; introduced from eastern North America; 1(o).

Fraxinus velutina Torr. Velvet Ash, Arizona Ash. [*F. pennsylvanica* Marsh. ssp. *velutina* (Torr.) G. N. Miller] Moderate trees; branchlets terete, densely spreading hairy to merely sparingly so, or glabrous; winter buds brown; leaflets 3-5 (or leaves simple), lanceolate to ovate, elliptic, or orbicular, petiolulate, cuneate to acute basally, acuminate to rounded apically, serrate, glabrous or hairy over the lower surface; flowers imperfect; calyx campanulate, persistent; corolla lacking; anthers oblong, apiculate; samaras 16-34 mm long, 4-6 mm wide, the blade decurrent about half way along the terete body. Indigenous tree of stream courses and flood plains in Washington and Iron counties, and cultivated there and elsewhere in Utah; Arizona and New Mexico. The phase with coriaceous leaflets has been treated as var. *coriacea* (Wats.) Rehd. (*F. coriacea* Wats.), but seems not to be worthy of taxonomic recognition, at least in Utah; 25(ii).

Note: The shrubby *Fraxinus dipetala* Hook. & Arn. is reported for Utah in Kearney & Peebles, 1961. Flora of Arizona, Supplement p. 1063. The related *F. cuspidata* Torr. is known from adjacent Mohave and Coconino counties, Arizona, and might occur in Utah. Both species have corollas present; the former has two petals and the latter has four.

LIGUSTRUM L.

Shrubs; leaves opposite, simple, entire; flowers perfect, white, showy through small, borne in terminal panicles, appearing after the leaves; calyx 4-toothed; corolla 4-lobed, funnellform; stamens 2, inserted on the corolla tube; ovary 2-loculed, 1- or 2-seeded; fruit a berry.

Ligustrum vulgare L. Common Privet. Deciduous or semievergreen shrub to 3 m tall or more, with puberulent to glabrate branchlets; leaves 2-6 cm long, 0.8-2 cm wide, oblong to

elliptic or ovate-lanceolate, glabrous; panicle dense, 3-6 cm long; corolla tube shorter than the lobes, white; anthers exserted; fruit 6-8 mm long, black, ovoid to subglobose. Cultivated hedge plant throughout Utah at lower elevations, persisting and escaping; introduced from Europe; 3(o).

MENODORA Humb. & Bonpl.

Subshrubs; leaves alternate or the lowermost opposite, simple, sessile or nearly so; flowers perfect, arranged in cymes; calyx 5- to 15-lobed; corolla yellow, subrotate, 5- to 6-lobed; stamens 2, inserted on the corolla tube; ovary 2-loculed, with 2-4 ovules per locule; style slender, the stigma capitate; fruit a circumscissile capsule.

Steyermark, J. A. 1932. Revision of the genus *Menodora*. Ann. Missouri Bot. Gard. 19: 87-176.

Menodora scabra Gray. Plants erect or ascending, commonly 2-3.5 dm tall, woody at the base only; leaves 0.5-2.9 cm long, 0.2-0.5 cm wide, narrowly elliptic to oblong or lanceolate, glabrous or scaberulous; calyx minutely puberulent, the lobes linear; corolla bright yellow, subrotate, the lobes 5-9 mm long; capsule 8-12 mm thick, membranous; seeds 4-5 mm long. Pinyon-juniper community, known in Utah only from Garfield, San Juan, and Washington counties; California, Arizona, New Mexico, Texas, and Mexico; 3(l).

SYRINGA L.

Shrubs or small trees; leaves opposite, simple, petiolate; flowers perfect, in terminal or lateral panicles; calyx campanulate, 4-toothed to nearly truncate, persistent; corolla tubular, the limb 4-lobed and rotate or nearly so; stamens 2, inserted on the corolla tube; ovary 2-loculed, each locule with usually 2 ovules; style with a 2-lobed stigma; fruit a loculicidal capsule.

- 1. Flowers cream to whitish, borne in large panicles; corolla tube 1-2.2 mm long, only half as long as the calyx; fragrance musky, not that of lilac; plants flowering in summer, often treelike 2
- Flowers lilac, violet, purplish, or white; corolla tube mostly 6-12 mm long or more, several times longer than the calyx; fragrance usually of lilac; plants commonly shrubs, flowering in spring or summer 3

- 2|1). Leaves ovate, rounded or subcordate basally, the veins prominent on the lower surface *S. amurensis*
 — Leaves lanceolate to elliptic or ovate-lanceolate, obtuse to cuneate basally, the veins not prominent *S. pekinensis*
- 3|1). Panicles from terminal buds; leaves of current season borne on branch with panicle; plants flowering in summer *S. villosa*
 — Panicles from lateral (or terminal) buds, the terminal buds often lacking; leaves of current season not borne on the branch with panicle; plants flowering in springtime 4
- 4|3). Leaves ovate to cordate, the base subcordate to obtuse; our most common species *S. vulgaris*
 — Leaves lanceolate to elliptic or ovate, obtuse to cuneate basally; common to uncommon 5
- 5|4). Leaves mostly less than 4 cm long, some often irregularly lobed; individual panicles short, mostly 7 cm long or less *S. persica*
 — Leaves often over 4 cm long, entire; individual panicles usually 8–12 mm long *S. x chinensis*

Syringa amurensis (Rupr.) Rupr. Amur Lilac. Shrubs or small trees to 5 m tall or more; leaf blades 3.5–13 cm long, 1.3–8 cm wide, ovate, rounded to obtuse of short acuminate basally, acuminate apically, the lower surface hairy to glabrous, the veins prominent; petioles mostly 1–2 cm long; panicles 10–15 cm long, the clusters of panicles usually much longer; flowers cream to white; stamens exserted. Sparingly cultivated ornamental of lower elevations in Utah; introduced from Japan; flowering in summer; 4(o).

Syringa x chinensis Willd. Chinese Lilac. Shrub to 4 m tall or more, with spreading and often arching branches; leaves 2.5–8 cm long, 1.5–4 (5) cm wide, ovate-lanceolate, obtuse to cuneate basally, acuminate apically, glabrous, the veins not prominent; petioles 0.5–1.5 cm long; panicles mostly 8–12 cm long, the clusters of panicles much longer; flowers purple lilac, or otherwise; stamens included. Commonly cultivated ornamental almost throughout Utah; introduced from the Old World. This plant is evidently of hybrid origin, having resulted from a cross between *S. persica* and *S. vulgaris*, q.v.; flowering in springtime; 3(o).

Syringa pekinensis Rupr. Peking Lilac. Shrub or small tree to 5 m tall or more, with

spreading branches; leaves 5–12 cm long, 2–4 (6) cm wide, lanceolate to ovate, cuneate basally, acuminate apically, glabrous, the veins not prominent; petioles 1.5–3 cm long; panicles mostly 8–15 cm long, the clusters of panicles to 30 cm long or more; flowers cream to yellow white; stamens exserted. Uncommon, cultivated ornamental in northern Utah, but to be expected elsewhere; introduced from China; flowering in early summer; 1(o).

Syringa persica L. Persian Lilac. Shrub to 2 m tall, with upright to arching branches; leaves 1.5–6 cm long, 0.6–3 cm wide, lanceolate to elliptic, sometimes lobed, cuneate to obtuse basally, acute to acuminate apically, glabrous, the veins not prominent; petioles 0.5–1 cm long; panicles mostly 3–7 cm long; flowers usually lilac but purple phases are known; stamens included. Uncommonly cultivated ornamental, especially in northern Utah; introduced from Asia Minor; flowering in springtime; 5(o).

Syringa villosa Vahl. Shrub to 3 m tall, rarely more, with erect branches; leaves 4–15 cm long (or more), 2.5–9 cm wide, ovate to elliptic, acute basally, abruptly acuminate apically, spreading hairy below, especially along the prominent veins; petioles 0.8–2 cm long; panicles mostly 10–18 cm long; flowers

pink lilac to white; stamens included. Sparingly but widely planted ornamental, mainly in northern Utah; introduced from China; flowering in summer; 4(o).

Syringa vulgaris L. Common Lilac. Shrubs to 4 m tall or more, the branches usually erect; leaves 3-12 cm long, 1.5-8 cm wide, ovate to cordate, cordate to rounded, truncate or obtuse basally, acute to acuminate apically, glabrous; petioles 0.8-3 cm long; panicles mostly 10-20 cm long; flowers lilac or white, seldom purple; stamens included. Abundantly cultivated ornamental, long persisting, in most of Utah; introduced from Europe; flowering in springtime. Many horticultural forms are known; 7(o).

PYROLACEAE

Wintergreen Family

Suffrutescent or herbaceous perennials; leaves simple, alternate, opposite, or appearing whorled, evergreen or much reduced and lacking chlorophyll; flowers usually perfect, regular, or irregular; calyx with 4 or 5 more or less distinct sepals; corolla with 4 or 5 more or less distinct petals (united in *Pterospora*); stamen twice as many as the petals, the anthers pendulous, opening by apparently terminal pores or by slits, or the anthers erect, awnless or 2-awned; pistil 1; ovary superior, 4- or 5-loculed; style 1; fruit a capsule.

- 1. Plants lacking chlorophyll; leaves reduced and scalelike, reddish, brownish, purple, or yellowish when fresh, often drying dark *Pterospora*
- Plants with chlorophyll (rarely without); leaves not reduced to scales, except rarely, commonly evergreen 2
- 2(1). Flowers solitary, the petals rotate or nearly so *Moneses*
- Flowers few to several, the petals concave 3
- 3(2). Stems leafy, though short, the leaves apparently whorled; flowers corymbose; staminal filaments dilated near the base; styles very short or lacking *Chimaphila*
- Stems leafy at base only; flowers in elongate racemes; filaments not especially dilated at the base; styles in most species over 2 mm long *Pyrola*

CHIMAPHILA Pursh

Low shrubs from creeping rhizomes, the stems erect or ascending; leaves evergreen, leathery, apparently whorled or some alternate; flowers (1) 2-several, borne in pedunculate, umbellate corymbs; sepals usually 5, distinct nearly to the base, persistent; petals usually 5, distinct, rotate-campanulate; stamens usually 10, the filaments dilated and ciliate near the base; anthers awnless, opening by falsely terminal pores on short tubes; ovary superior, 5-lobed and 5-loculed; fruit a loculicidally dehiscent capsule.

Cimaphila umbellata (L.) Bart. Pipsissewa, Prince's Pine. (*Pyrola umbellata* L.; *C. occidentalis* Rydb.; *C. umbellata* ssp. *occidentalis* (Rydb.) Hulten). Plants (1) 1.5-2.5 (3) dm tall, the stems glabrous, only somewhat

woody; leaves 1.5-4.5 (6) cm long, 0.5-1.5 (2) cm wide, elliptic to oblanceolate, cuneate basally, sharply serrate, shining above, pale beneath, glabrous; peduncles 4-7 (10) cm long, glabrous or minutely glandular-puberulent, often suffused with red purple; pedicels glandular-puberulent or merely puberulent; flowers 1-6 or more, umbellate-corymbose; sepals crose-ciliate; petals 5-7 mm long, pink; stamens with expanded bases ciliate; capsules 5-7 mm broad. Coniferous forests, 2300-2750 m, in Duchesne, Summit, Uintah, and Washington counties; Alaska, southward to California and Mexico, east to New Mexico and Colorado, and in the eastern United States; Eurasia. Our materials are referable to var. *occidentalis* (Rydb.) Blake; 4(o).

MONESSES Salisb.

Rhizomatous herbs; leaves with chlorophyll, leathery, persistent, mainly basal, but sometimes opposite or in whorls; flowers solitary, nodding, borne on a long peduncle; sepals usually 5, persistent; petals usually 5, distinct, spreading; stamens usually 10, the filaments tapering to the apex, the anthers awnless, nodding, opening by means of apparently terminal pores; ovary superior, 5-loculed, the stigma borne on an elongate, glabrous style; fruit a loculicidal capsule.

Moneses uniflora L. Single Delight, Waxflower. (*M. reticulata* Nutt.; *M. uniflora* var. *reticulata* (Nutt.) Blake). Plants 0.4-1.7 dm tall; leaves (including petioles) 0.8-4 cm long, 0.6-2 cm broad, serrate to crenate-serrate; peduncles 3-15 cm long, usually with 1 or 2 bracts along its length; flowers 1.3-2.5 cm broad, white to cream; sepals 1.5-2.5 m long, ciliate; petals 7-11 mm long, spreading; style 2-4 mm long; capsule 5-8 mm broad. Moist sites in coniferous forest, 2450-3050 m, in Beaver, Carbon, Duchesne, Emery, Juab, Salt Lake, and Utah counties; widely distributed in North America; Eurasia; 9(ii).

PTEROSPORA Nutt.

Plants herbaceous saprophytes, devoid of chlorophyll, tall, reddish or purplish brown, the stems arising from a bulbous cluster of coralloid roots; leaves alternate, simple, scalelike, colored like the stems; flowers numerous, borne in an elongate raceme, nodding; calyx 5-lobed; corolla urn-shaped, the tube much longer than the lobes; stamens 10,

the filaments flattened, tapering to the apex, glabrous, the anthers with 2 recurved awns, dehiscent almost throughout; ovary superior, 5-loculed, the stigma borne on a short thick style; fruit a loculicidal capsule.

Pterospora andromeda Nutt. Pinedrops. Plants erect, the stems simple, 2-8.5 (10) dm tall, reddish brown, succulent, arising from a cluster of roots to 5 cm in diameter, glandular-hairy, leafy only near the base; racemes 3-35 cm long or more; flowers 5-8 mm long, nodding, axillary; pedicels 5-15 mm long, recurved; sepals oblong, glandular; corolla pale yellow, depressed urn-shaped; capsule 8-12 (14) mm broad, 5-lobed, depressed globose. Coniferous forest, 2300-2900 m, in Daggett, Duchesne, Garfield, Grand, San Juan, Summit, Uintah, and Washington counties, and to be expected at higher elevations elsewhere; widely distributed in North America; 15(iii).

PYROLA L.

Rhizomatous herbs; leaves with chlorophyll, leathery, persistent, all basal or apparently so, or rarely lacking and the plants then partially or completely saprophytic; flowers regular to irregular, borne in terminal racemes; sepals 5, united at the base; petals 5, distinct, usually concave, deciduous; stamens 10, the filaments tapering to the apex, the anthers unawned, pendulous, opening by means of apparently terminal pores; ovary superior, 4-loculed, the stigma borne on a straight or curved style; fruit a loculicidal capsule.

Copeland, H. F. 1947. Observations on structure and classification of the Pyroleae. *Madroño* 9: 65-102.

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| 1. | Styles straight or nearly so; pores of anthers sessile; stigma usually much broader than the style | 2 |
| — | Styles bent or curved; pores of anthers usually borne on short tubes; stigmas only slightly broader than the styles | 3 |
| 2(1). | Styles 2 mm long or less, not (or seldom) exerted from the flower; flowers not secund; petals pinkish to cream | <i>P. minor</i> |
| — | Styles over 2 mm long, exerted from the flower; flowers secund; petals greenish white | <i>P. secunda</i> |
| 3(1). | Flowers pink to purplish; sepals longer than broad | <i>P. asarifolia</i> |
| — | Flowers pale, greenish yellow; sepals broader than long | <i>P. virens</i> |

Pyrola asarifolia Michx. Liver-leaf Wintergreen. (*P. rotundifolia* var. *bracteata* (Hook.) Gray; *P. asarifolia* var. *bracteata* (Hook.) Jeps.; *P. rotundifolia* var. *purpurea* Bunge; *P. asarifolia* var. *purpurea* (Bunge) Fern.; *P. incarnata* Fisch. in DC.; *P. asarifolia* var. *incarnata* (Fisch.) Fern.; *P. asarifolia* var. *ovata* Farw.; *P. uliginosa* T. & G. ex Torr.; *P. rotundifolia* var. *uliginosa* (T. & G.) Gray; *P. asarifolia* var. *uliginosa* (T. & G.) Farw.; *P. elata* Nutt.; *P. bracteata* var. *hilli* J. K. Henry). Plants 1.3–4 dm tall; leaves basal or essentially so, the blades 1.3–7.5 cm long, 1.1–7.3 cm wide, oval, rotund, elliptic, or obovate, subcordate to rounded, obtuse, or acute basally, rounded to obtuse or emarginate apically, entire to serrulate; petioles 1–9 cm long; racemes mostly 2- to 12-flowered; pedicels 3–8 mm long; sepals longer than broad, 1.5–4 mm long; petals pink to purplish, 5–7 mm long; anthers pink, the pores on short tubes; style curved, with a flaring collar below the stigma. Coniferous and deciduous woods, often along streams, or less commonly in meadows, 1750–2750 m, in Daggett, Duchesne, Emery, Garfield, Grand, Iron, Juab, Piute, Rich, Salt Lake, Summit, Uintah and Washington counties (and likely elsewhere); Alaska east to Newfoundland and south to California, New Mexico, South Dakota, and New England; Asia. Varietal status of Utah materials is not clear; 30(iv).

Pyrola minor L. Lesser Wintergreen. (*Amelia minor* (L.) Alef.; *Erxlebenia minor* (L.) Rydb.; *P. minor* var. *conferta* C. & S.; *P. conferta* (C. & S.) Fisch. ex Ledeb.). Plants 0.8–2.4 dm tall; leaves basal, the blades (0.4) 1.1–3.3 cm long, (0.6) 0.9–2.5 cm broad, oval, elliptic, or ovate, obtuse to rounded or subcordate basally, obtuse to rounded apically, crenate to subentire; petioles 0.2–3 cm long; racemes mostly 5- to 13-flowered; pedicels 2–3 mm long; sepals 1–1.5 mm long, erose to subentire; petals pale pink to cream, 3.5–4.5 mm long; anthers with pores sessile; style straight, very short, not exerted from the corolla, with a more or less distinctive collar below the stigma. Wet stream sides and other moist sites, usually in coniferous forests, 2150–2750 m, in Beaver, Daggett, Duchesne, Garfield, Juab, Salt Lake, Sevier, Summit, Uintah, and Washington counties; Alaska and

Yukon east to Greenland and south to California and Colorado; circumboreal; 11(i).

Pyrola secunda L. One-sided Wintergreen. (*Ramischia secunda* (L.) Garke; *Actinocyclus secundus* (L.) Klotzsch; *P. secunda* var. *obtusata* Turcz.; *Orthilia secunda* var. *obtusata* (Turcz.) House; *P. secunda* var. *pumila* Paine; *P. secunda* f. *eucycla* Fern.). Plants 0.6–1.8 (2.1) dm tall; leaves basal or rarely some cauline, or sometimes with a naked stem below the leaves, the blades 1.3–4 (5) cm long, 1–3 cm wide, ovate, oval, elliptic, or orbicular, obtuse to rounded basally, acute to obtuse or rounded apically, crenate-serrate; petioles 0.6–2 cm long; racemes mostly 4- to 15-flowered, the flowers secund; pedicels 2–5 mm long; sepals 0.5–1.5 mm long; petals greenish white, 4–6 mm long; anthers with pores sessile; style straight, exerted from the corolla, lacking a collar. Ground layer in usually coniferous forests, 2000–3350 m, in Box Elder, Carbon, Daggett, Duchesne, Garfield, Juab, Kane, Piute, Salt Lake, San Juan, Sanpete, Summit, Uintah, Utah, and Washington counties, broadly distributed in North America; Eurasia. Segregation of our materials into the various proposed infraspecific categories seems unwarranted; 33(vi).

Pyrola virens Schweigg. in Schweigg. & Koerte. Greenish Wintergreen. (*P. chlorantha* Sw.; *P. chlorantha* var. *saximontana* Fern.; *P. virens* var. *saximontana* (Fern.) Fern.; *P. chlorantha* var. *paucifolia* Fern.; *P. virens* f. *paucifolia* (Fern.) Fern.; *P. chlorantha* f. *paucifolia* (Fern.) Camp). Plants 0.9–2.5 dm tall; leaves basal, the blades 0.6–3.5 cm long, 0.5–3 cm broad, elliptic, oval, or obovate, obtuse to rounded basally, rounded to obtuse apically, crenate-serrate to subentire; petioles 0.8–6 cm long; racemes mostly 2- to 9-flowered; pedicels 3–8 mm long; sepals 0.5–1.5 mm long; petals greenish yellow, 5–7 mm long; anthers yellowish, the pores on elongate tubes; style curved, with a flaring collar below the stigma. Coniferous or deciduous woods, often in moist sites, 2150–2750 m, in Daggett, Duchesne, Piute, Salt Lake, Summit, and Uintah counties; widely distributed in North America; Eurasia; 8(i).

RESEDACEAE

Mignonette Family

Annual or perennial herbs with watery sap; leaves alternate, simple, or pinnately to subpalmately divided; flowers perfect, irregular, borne in terminal racemes; sepals (4) 5-6 (8), distinct; petals (4) 5-6 (8), unequal in size, the upper one the largest, appendaged; stamens 5 or more, borne on the upper side of a rounded disk, the anthers 2-loculed; pistil 1, the ovary superior, 1-loculed, with usually 3 (2-6) carpels; style lacking; fruit a capsule, usually open at the tip before maturity.

RESEDA L.

Erect or ascending annual or perennial herbs from a taproot; leaves alternate; flowers greenish yellow; sepals subequal; petals unequal; pistils 1, the carpels usually 3, open toward the apex.

Reseda lutea L. Yellow Mignonette. Plants simple or much branched, glabrous; leaves pinnatifid or subpalmately divided; flowers greenish yellow, numerous, borne in elongate racemes; petals usually 6, each commonly with 3 connate or distinct appendages; ovary and capsule usually with 3 apical lobes. Cultivated ornamental; rarely escaping in Utah; 1(o).

TAMARICACEAE

Tamarisk Family

Shrubs or small to moderate trees; leaves alternate, scalelike, exstipulate, entire; flowers mostly perfect, regular, borne in spikelike racemes arranged in panicles; sepals 4 or 5, overlapping; petals 4 or 5, separate, more or less overlapping, arising from the base of a nectiferous disk; stamens usually as many or twice as many as the petals, the anthers 2-loculed; pistil 1, the ovary superior, unilocular, usually 3 or 5 carpelled, the placentation basal; stigmas 2-5, separate; ovules 2 per placenta; fruit a capsule, the seeds comose.

Baum, B. R. 1967. Introduced and naturalized tamarisks in the United States and Canada (Tamaricaceae). *Baileya* 15: 19-25.

TAMARIX L.

Deciduous or evergreen shrubs or trees, the branchlets deciduous; leaves clasping or sheathing; flowers small, shortly pedicelled; petals white to pink or lavender, inserted below the disk; capsules dehiscent by 3-5 valves.

- 1. Leaves sheathing; evergreen trees of moderate size, restricted to Washington County *T. aphylla*
- Leaves not sheathing, at most merely clasping; deciduous trees of small size or merely shrubs of broad distribution 2
- 2(1). Flowers 4-merous, or the stamens sometimes more than 4; stamens emerging gradually from the disk-lobes; plants uncommon both in cultivation and as escapes *T. parviflora*
- Flowers 5-merous, or the stamens sometimes more than 5; stamens inserted under disk near the margin between the emarginate lobes; plants abundant, cultivated and otherwise *T. ramosissima*

Tamarix aphylla (L.) Karst. Athel Tamarisk. (*Thuja aphylla* L.) Trees to 10 m tall and 6 dm in diameter or more, the bark reddish brown to gray; branchlets jointed; leaves sheathing, minute, evergreen; bracts longer than the pedicels; flowers 5-merous; sepals entire, the inner ones slightly larger; petals elliptic-oblong to ovate, 2-2.2 mm long, early deciduous or with 1 or 2 persisting; sta-

mental filaments inserted between the disk lobes. Cultivated sparingly in Washington County, where it seldom flowers; native to Africa and the Middle East; introduced in California, Nevada, Arizona, and Texas; 2(i).

Tamarix parviflora DC. Small-flowered Tamarisk. Shrubs or small trees to 5 m tall; bark brown to deep purple; branchlets not jointed; leaves merely sessile, not sheathing,

deciduous with the branchlets; bracts longer than the pedicels, more or less translucent; flowers 4-merous; sepals erose-denticulate, the outer two keeled and acute, the inner flat or slightly keeled and obtuse; petals oblong to ovate, 1.9-2.3 mm long, persistent; staminal filaments arising gradually from disk-lobes. Cultivated and naturalized along streams and seeps, in Emery, Kane, Utah, and Washington counties, and to be expected elsewhere; introduced from southern Europe and now widespread in Canada and the United States; 7(i).

Tamarix ramosissima Ledeb. Branched Tamarisk; Salt Cedar. (*T. gallica* authors, not L.; *T. pentandra* authors, not Pall.). Shrubs or small trees to 6 m tall, or rarely more; bark reddish brown; branchlets not jointed; leaves merely sessile, not sheathing, deciduous with the branchlets; bracts longer than the pedicels, scarious but scarcely translucent; flowers 5-merous; sepals erose-denticulate, the outer 2 narrower than the inner, all more or less acute; petals obovate, 1-1.8 mm long, persistent; filaments inserted under the disk near the margin between the emarginate lobes. Cultivated and naturalized along seeps, streams, and reservoirs, almost throughout Utah (Carbon, Davis, Duchesne, Emery, Gar-

field, Grand, Juab, Kane, Millard, San Juan, Sevier, Tooele, Uintah, Utah, Wasatch, Washington, Wayne, and Weber counties); introduced from Eurasia, now widespread in the southern United States; 99(xix).

TILIACEAE

Linden or Basswood Family

Trees; leaves alternate, simple, serrate to obscurely lobed, usually oblique, stipulate; flowers regular, perfect, borne in cymes; sepals 5, distinct or more or less connate; petals 5, alternate with the sepals; stamens numerous, the filaments free or connate in bundles of 5-10; ovary superior, 5-loculed; fruit drupaceous.

TILIA L.

Cultivated trees; leaves long-petioled, the blades obliquely cordate, serrate or doubly so, sometimes obscurely lobed; flowers in long-peduncled cymes, the peduncle adnate at its base to a ligulate bract; sepals 5; petals 5; stamens numerous, distinct or in 5 clusters, sometimes bearing petaloid staminodia opposite the petals; ovary 5-loculed, the stigma 5-lobed; fruit subglobose, 1- to 3-seeded.

- 1. Branchlets and petioles densely white-hairy; leaf blades white stellate hairy beneath *T. tomentosa*
- Branchlets and petioles glabrous or nearly so; leaf blades variously pubescent or glabrous 2
- 2(1). Leaf blades hairy (sometimes thinly so) over the lower surface and usually along the veins beneath 3
- Leaf blades glabrous beneath, except in vein axils 5
- 3(2). Leaf blades densely white or brown stellate hairy beneath *T. heterophylla*
- Leaf blades variously hairy but the surface not obscured by hairs 4
- 4(3). Hairs of lower leaf surface stellate, at least some; flowers with staminodes *T. neglecta*
- Hairs of lower leaf surface all simple; flowers without staminodes *T. platyphyllos*
- 5(2). Leaf blades definitely glaucous beneath, usually less than 8 cm long; flowers lacking staminodes *T. cordata*
- Leaf blades green or merely pale green beneath, the largest usually more than 8 cm long; flowers with or without staminodes 6

- 6(5). Flowers with staminodes; leaves serrate to doubly serrate with long-acuminate teeth, the largest blades on flowering stems to 10 cm long or more *T. americana*
- Flowers without staminodes; leaves serrate with short acute teeth, the largest blades on flowering stems usually less than 10 cm long *T. europaea*

Tilia americana L. American Linden. Moderate to large trees of streets and other ornamental plantings, common in Salt Lake, Utah, and Weber counties, and probably grown elsewhere; indigenous to the eastern states and Canada; 9(o).

Tilia cordata L. Small-leaved European Linden. Small to large trees of ornamental plantings; common in Box Elder, Cache, Juab, Salt Lake, Utah, and Weber counties; widely cultivated in North America; introduced from Europe; 12(o).

Tilia x europaea L. Common or European Linden. Moderate to large trees of ornamental plantings, uncommon in Utah; indigenous to Europe. This tree is reputed to be a hybrid derivative of *T. cordata* x *T. platyphyllos*; 2(o).

Tilia heterophylla Vent. White Basswood. Large ornamental trees, uncommon in Utah; indigenous to the eastern United States; 2(o).

Tilia neglecta Spach. Moderate to large ornamental trees, uncommon in Utah; indigenous to the eastern United States and Canada. This taxon resembles, and apparently intergrades with, *T. americana*, with which it is very closely allied; 2(o).

Tilia platyphyllos Scop. Large-leaved Linden. Moderate to large ornamental trees, common in Salt Lake, Utah, and Weber counties, and probably elsewhere; indigenous to Europe; 8(o).

Tilia tomentosa Moench. Silver Linden. Moderate to large ornamental trees, moderately common in Cache, Juab, Salt Lake, Utah, and Weber counties; indigenous to eastern Europe and Asia Minor; 5(o).